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USSR Report

ENERGY

No. 88

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CONTENTS

ELECTRIC POWER

Kazakh Minister Reviews Republic's Power Engineering
(B. Ivanov; KAZAKHSTANSKAYA PRAVDA, 21 Dec 81)............... 1

Kirghiz Power Engineering Plans Reviewed
(M. Azrilyan; SOVETSKAYA KIRGIZIYA, 22 Dec 81)............... 5

Development, Prospects of UkSSR Rural Power Networks
(A. V. Gritsenko, V. M. Tsvyakh; ENERGETIKA I ELEKTRIFIKATSIYA, Jul-Sep 81)............................... 7

Construction Report on Gazalkentskaya GES
(E. Avakov; SOTSIALISTICHESKAYA INDUSTRIYA, 14 Nov 81)....... 12

Ekibastuz GRES No 1 Construction Report
(V. Stupak; KAZAKHSTANSKAYA PRAVDA, 4 Nov 81)................ 14

Briefs

New Power Lines in Mountains 16
Maryyskaya GRES Power Lines 16
More on Maryyskaya GRES Lower Lines 16
Final Power Unit at the Gallalkentskaya GES 17
Moldavian GRES 17
Maryyskaya GRES Construction Report 18

ENERGY CONSERVATION

Baltic Republics Demonstrate Energy-Saving Devices in Moscow
(N. Karpenko; SOVETSKAYA LATVIYA, 4 Nov 81).................. 19

Measures for Conserving Petroleum Products in Belorussian Agriculture
(SEL'SKAYA GAZETA, 18 Dec 81)................................ 21

Causes Of, Remedies for Coal Losses During Rail Transport Argued
(B. Sikorenko; EKONOMICHESKAYA GAZETA, Nov 81)................ 25

Industrial Test of New Combustion Technique for Power Plants Delayed
(K. Seleznev, V. Pomerantsev; IVEZTIYA, 13 Nov 81)............ 29

FUELS

Two Agencies Argue Over Which Should Supply Pipeline Builders
(V. Lozovoy; SOTSIALISTICHESKAYA INDUSTRIYA, 12 Nov 81)....... 32

Urengoy-Petrovsk Pipeline Construction Progress
(STROITEL'NAYA GAZETA, 7, 26 Aug 81).......................... 34

As of 6 July 1981
As of 24 August 1981

Confernece Held at Kiev To Promote Pipeline Improvements
(PRAVDA UKRAINY, 14 Nov 81)................................... 37

Construction of Gas Pipelines
(A. K. Dertsakyan, I. P. Novikov; STROITEL'STVO TRUBOPROVODOV, Oct 81)... 38

Clad Pipelines Built for 100, 120 Atmospheres' Pressure Planned
(Yu. Bokserman; IZVESTIYA, 11 Nov 81)......................... 42

GENERAL

Timano-Pechorsk Territorial-Production Complex Report
(N. Zashikhin; SOTSIALISTICHESKAYA INDUSTRIYA, 14 Nov 81)... 45

ELECTRIC POWER

KAZAKH MINISTER REVIEWS REPUBLIC'S POWER ENGINEERING

Alma Ata KAZAKHSTANSKAYA PRAVDA in Russian 21 Dec 81 p 3

[Article by B. Ivanov, minister of power and electrification of the Kazakh SSR: "At An Increasing Pace"]

[Text] As the country's power engineering enters a new stage in the development of a unified power system and as opportunities are created for drawing all producers and consumers of energy into it, Kazakhstan's role is sharply increasing.

It has been noted at the 15th Communist Party Congress of Kazakhstan that our republic's power engineering is faced with not only ensuring its own needs but also with supplying more electric power to consumers beyond its boundaries. It will be necessary to generate at least 90 to 95 billion kW-hours.

In this connection, I recall a meeting with power workers, delegates to the congress. We have talked about new advances in the development of our sector as outlined by the Draft plan of the CPSU Central Committee to the 26th party congress. Today a certain part of these grandiose plans has already been implemented. During the year, enterprises of the Kazakh SSR Ministry of Power and Electrification have commissioned 1,180 megawatts of new capacities and the output of electric power totaled 55.5 billion kW-hours. The length of all power transmission lines has increased by 16,000 km and 59 sovkhoz and kilkhoz sections have been connected to centralized power supply.

The past year has provided a running start for the new, 11th Five-Year Plan, which has set great tasks before us. The fact that state capital investments in the republic's power engineering have increased by 30 percent compared with the past 5-year period and amounted to 1.83 billion R speaks for itself. By 1985, the output of electric power in the republic will increase 1.6 times compared with 1980 and will reach 86.6 million kW-hours. At the same time, power supply to agriculture will increase 1.5 times. The supply of thermal energy during the same period will be increased by almost 1.3 times and will total 59 million gigacalories.

A stepped-up plan in all indicators must also be fulfilled next year. For example, it will be necessary to generate 1.2 times more electric power than this year. "From this it is evident," L. I. Brezhnev said at the November (1981) plenum of the CPSU Central Committee, "that it will be necessary to double, to triple efforts so that it will be fulfilled.... The plan will become a law of our life and activities after confirmation and, therefore, it must be regarded as law, as the most important party and state document by all, from worker to minister." The intensively developing economy of the republic places special demands on us, the power workers, according to D. A. Kunayev, CPSU CC Politburo member and first secretary of the Kazakhstan CP CC, in his address at the December plenum of the Kazakhstan CP CC.

The plan indexes must not only be unconditionally fulfilled but also exceeded, and this will require further improvement in the style and methods of our entire work and solution of some problems, including those which must be solved jointly. Let us, for example, take the problem of fuel supply. The necessary supply of quality fuel at electric power stations is one of the first conditions for their dependable and continuous operation. Last year, during preparations to properly welcome the 26th CPSU Congress, we reached an agreement on competition with our neighbors--coal miners and railroad workers. One-half year of such cooperation has proven its advantages, and it has been decided to extend this agreement for the duration of the 5-year plan. However, its efficiency can undoubtedly be much higher. We must develop such systems of accounting and plan indicators so that all participants in the agreement will be more interested in improving work quality.

The questions of careful expenditure of fuel demand much attention. During the past 10 years, the expenditure of fuel to generate 1 kW-hour has been reduced on an average by 51.3 g in the republic. But it is still intolerably high at many electric power stations. Experience proves that often elimination of fuel losses requires no additional outlays but only introduction of elementary order: organization of correct operation and prompt repair of equipment. It is necessary to have stricter control over energy use in the industry. There are still many unused reserves for economizing power resources in the housing and public utilities sector.

Currently among all the tasks facing us, the ones that are connected with Ekibastuz are the immediate ones. The kind of role played by it today in the republic's power engineering is eloquently expressed by the fact that, out of 1,169,000 kW of new capacities to be commissioned next year, its share will amount to 1 million kW. In the long term, the four large GRES's under construction there will double the republic's power potential. The first supports of Ekibastuz's unique high-power transmission lines--Ekibastuz-Tsentr and Ekibastuz-Ural--which will soon convey the energy of Ekibastuz, have already been erected. This is why at the December plenum of the Kazakhstan CP CC the Ekibastuz fuel and power complex was referred to as being among the main projects in the republic. The party and government are rendering us invaluable aid in this respect and power workers will apply every effort to fulfill the plan.

The ETEK [Ekibastuz fuel and power complex] is an all-union shock Komsomol construction project, and this says a lot because the Komsomol has more than a half-century of experience sponsoring power engineering projects. The pace at the construction site is being set by leading Komsomol youth collectives, such as the assembly workers team of the Ekibastuzenergostroy trust headed by V. Sizintsev, winner of the Kazakh SSR state prize.

Installation of the fourth power-generating unit of the Ekibastuzskaya GRES-1 has been completed almost twice as fast as the first. But it is necessary to increase the rate of commissioning subsequent units. So long as there is still an acute shortage of personnel in Ekibastuz, the significance of on-schedule commissioning of housing and social and cultural facilities is readily understood.

The solution of all tasks facing us urgently requires that we look for new ways to raise the efficiency of power output. One of the ways is the brigade method of organizing labor and wages. Today we already can say with confidence that Zlobin's method is also good for power construction workers. This is testified to by the successes of our leading collectives such as the team of the Alma-Atinskaya mobile mechanized column of the Kazelektrosetstroy trust headed by M. A. Otradnykh, which has been working according to the brigade contract method since 1974. To the distinguished team leader's awards of the Orders of Lenin and the Red Banner of Labor, a new award, the gold star of Hero of Socialist Labor was added this year. It is already March 1982 and his brigade's current calendar. Life proves that brigades are advantageous not only in construction but also in maintenance and operation of power networks. We are also introducing this progressive method in repair brigades of production and repair enterprises and power stations; this is improving the quality of repairs and reducing the time needed to make them, thus raising the equipment's operational dependability. Currently 17,612 people, or more than one-third of all workers in the sector, are using the brigade labor organization method.

Leading experience augmented by initiative and socialist competition is an inexhaustible source for improving work quality. During the past 5-year plan, V. F. Sergiyenko, boiler operator of the Pavlodarskaya TETs-2, came forward with an initiative to credit "Economized Fuel to the Five-Year Plan Personal Account." During the 5-year plan period, his personal account was credited with 1,250 tons of conventional fuel, 620,000 kW-hours of electric power, and 476 tons of mazut; and the savings from the rationalization proposals that he submitted amounted to more than 8,000 R. This good initiative was actively supported by the collective, and this has reflected on its work results. Based on the results of the past 5-year plan, the communist labor collective of the Pavlodarskaya TETs-2 was among enterprises awarded the Challenge Red Banner of the Kazakhstan CP CC, the Kazakh SSR Council of Ministers, the Kazakh Council of Trade Unions, and the Komsomol Central Committee of Kazakhstan. This year it is again in the vanguard of competition together with the communist labor collective of the Order of Red Banner of Labor Dzhambulskaya GRES imeni Oktyabrskoy Revolyutsii, which, during a course of three 5-year plans, has been winner in the all-union socialist competition. "I have seen people who personify the ideas of Marxism-Leninism," (Noma Niroshi), a Japanese writer, wrote in the guest log which is kept in the room of the GRES's labor glory. "Participation by workers in production management has had a positive effect on production indicators. I would like to maintain relations with you in the future." A delegation of Danish communists left the following entry: "The GRES is a graphic example of the gigantic strides made by you in advancing toward communism." During its 17-year existence, the collective of the Dzhambulskaya GRES accumulated many glorious traditions. One of them is to work on economized fuel during the country's notable days. So today, on the Power Worker's Day, the GRES will supply energy to its consumers from economized fuel.

What determines successes of our leading enterprises? During the past plenum of the CPSU Central Committee (1981), Leonid Ilich Brezhnev said: "Organization, business-like manner, discipline--these are the indispensable requirements at the Center as well as locally." Organization, business-like manner, and discipline are the basis of labor achievements of our leading workers and, therefore, the work of all power workers of Kazakhstan, who, through their daily labor, are recording new lines in the history of the creation of the republic and, thus, of the entire country, must be built precisely on this formula.

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ELECTRIC POWER

KIRGHIZ POWER ENGINEERING PLANS REVIEWED

Frunze SOVETSKAYA KIRGIZIYA in Russian 22 Dec 81 p 1

[Article by M. Azrilyan, chief of Kirgizglavenergo: "Plus Electrification"]

[Text] This year Power Worker's Day is being observed under the conditions of great labor and political enthusiasm elicited by the decisions of the 26th party congress and the November (1981) plenum of the CPSU Central Committee.

At all stages of construction our party has attached and attaches paramount significance to rapid development of power engineering and to accelerated establishment of a fuel and power complex--the bases of the material and technical base of communism. Even at the start of Soviet power, Vladimir Ilich Lenin referred to the state plan for electrification of Russia (GOELRO) as the party's second program.

Workers of Kirghizstan are proud of their achievements in the development of power engineering and electrification of the mountainous region, which as an integral part of the country's fuel and power complex is developing on the basis of unified national economic plans.

The republic's power engineering made a major step forward during the 10th Five-Year Plan. Some 315 million R in capital investments were directed toward its development. The power and thermal capacities of the power system have increased and 8,000 km of power transmission lines have been built, including the special purpose alpine LEP-500 and the Toktogulskaya GES-Frunze lines. Generation of electric power has increased 2.6 times.

A comprehensive system to control quality and to raise efficiency has been introduced in the sector, which made it possible to substantially improve technical and economic indicators. Thus the production cost per kW-hour of electric power has been reduced by 31.8 percent while labor productivity has increased by 184.6 percent and the capital-output ratio by 21.9 percent. As a result of reduced proportionate expenditures of fuel and costs of power in electric and thermal networks, 35,000 tons of conventional fuel has been saved during the 5-year period.

Kirghiziya has now been transformed from a consumer to a major supplier of electric power. Some 9 billion kW-hours have been supplied to neighboring fraternal republics during the 5-year period.

Kirghiziya has not been transformed from a consumer to a major supplier of electric power. Some 9 billion kW-hours have been supplied to neighboring fraternal republics during the 5-year period.

Development of power engineering in the mountainous region is a striking example of the transforming power of the Leninist GOELRO plan. From several low-powered diesel generators to unique hydroelectric power stations--such is the path traversed by the republic within a brief historic period. Here are some landmarks of its "power engineering" biography. A new unit of the Uch-Kurganskaya GES was commissioned 20 years ago. Since then the forerunner of the Narynskiy cascade stations has generated 14.5 billion kW-hours of energy. The first record of the Toktogulskaya GES, flagship of Kirghiziya's hydropower energy, being placed on load was made on 14 January 1975. The station now has 13 billion kW-hours of cheap electric power to its credit. Almost 500 million kW-hours have already been generated by the first hydroelectric unit of the Kurpsayskaya GES, which was commissioned ahead of schedule on 21 February this year. The second unit is ready for operation and will be ceremoniously commissioned in a few days.

During the entire period the cascade of hydroelectric power stations on Naryn has generated nearly 30 billion kW-hours of electric power.

Successful fulfillment of the 10th Five-Year Plan tasks has been a reliable starting base for development of the sector during the new 11th Five-Year Plan.

The tasks set for ensuring the growing needs of national economy in thermal and electric energy are being fulfilled with confidence. The power system has coped with its plans for the volume of implementation and generation of thermal and electric energy. By reducing proportionate expenditures at thermal electric power stations some 3,000 tons of conventional fuel has been saved. Labor productivity in the sector has increased by 8.8 percent. Power workers of Kirghizstan will generate 10 billion kW-hours of electric power this year or 1.1 billion kW-hours more than in 1980.

Broad prospects are ahead for the republic's power engineering in the 11th Five-Year Plan. The Kurpayskaya GES will be commissioned to full capacity. The Tashkumyrskaya hydroelectric station will become operational. Its construction is already underway at full speed.

It is also envisaged to fulfill a great deal of work in construction of more than 9,000 km of power transmission lines. Further electrification of agriculture will proceed at an especially high rate. Additional thermal capacities for 880,000 tons of steam per hour will be commissioned at the Frunzenskaya TETs and 18 km of mainline heating systems will be built.

During the current five-year plan it is planned to carry out planning and surveying work aimed at mastering hydropower resources of the Sary-Dzhaz River and the midstream of Naryn and also to draw the Kavakskoye coal deposit into national economic circulation. This will serve as a basis for further increasing the republic's power potential during the next 12th Five-Year Plan.

The power workers have now entered a responsible work period, connected with the passing of the fall-winter peak loads. Under these conditions our efforts are directed at ensuring a dependable supply of power to the national economy and of thermal and electric energy to the population and at every possible way of saving fuel and power resources.

9817
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ELECTRIC POWER

DEVELOPMENT, PROSPECTS OF UkSSR RURAL POWER NETWORKS

Kiev ENERGETIKA I ELEKTRIFIKATSIYA in Russian No 3, Jul-Sep 81 pp 3-5

[Article by A.V. Gritsenko, UkSSR deputy minister of Power and Electrification, and V.M. Tsvyakh, chief engineer of the Ukrainian Department of the "Selenergoproekt" Institute: "Trends in the Development of Rural Power Networks in the UkSSR for 1981-1985 and Prospects for Period up to 1990"]

[Text] Electrification of agriculture has been one of the main means of its technical advance. It has been characterized by a high rate of growth in consumption of electric energy in the republic's agriculture, which reached 18.5 billion kW hours in 1980 or 4 times more than in 1965.

The power-worker ratio in agriculture has considerably increased and has been doubling every 5 years on the average, reaching 2,400 kW hours per worker in 1979. This has been made possible as a result of completion of extensive construction of rural power networks, intensification of agricultural production and its conversion to an industrial basis.

By the end of 1980 the length of agricultural-purpose powerlines of 110-kilovolt and less has reached 680,000 km and the installed capacity of agricultural-purpose substations of 35 to 110 kV totaled 16.4 million kV-ampere and of 10/0,4 kV some 20.6 million kV-ampere.

Despite the high rate of development of power networks, the reliability of power supply to agriculture and the quality of electric energy do not correspond to the increased requirements demanded by modern agricultural production.

The main trends in raising reliability of power supply to agricultural consumers are:

Optimization and long-range development of 10-110 kV agricultural-purpose power networks including introduction of complete automation of power network regions;

Utilization in long-term of new supports of a more stable kind under sleet, wind and atmospheric exposure for 0,4-110 kV powerlines, steel and aluminum wire, insulators and glass-reinforced plastic cross arms;

Utilization in rural power networks of technically improved equipment (switches, separators, load-breaking isolators, circuit breakers and measuring transformers);

Steady growth of higher quality of construction and installation and repair and maintenance work in power networks;

Mass introduction of complete automation in rural power networks with utilization of new technically improved protective relay devices, automatic equipment, telemechanics and electronic microcomputers; and

Introduction of progressive forms of training of engineering and technical personnel and workers.

1. Optimization and long-range development of 10-110 kV agricultural-purpose power networks including complete automation will basically proceed in the following directions:

1.1. Further development of 35-110 kV power networks and their transition to the distributing category;

1.2. Broad utilization of voltage regulation under load on 35-110/10-6 kV power transformers; and

1.3. Mass introduction in rural power networks of reactive power and capacitive current compensating devices.

The length of 35-110 kV agricultural-purpose overhead lines will total 62,000 km in 1985 and will double compared with 1975.

The relationship between the length of 35-110 kV overhead lines and the length of 10 kV overhead lines will be 1:5 in 1985, which testifies to the approaching of high voltages to consumers.

The relative share of 110 kV overhead lines in the overall volume of construction of 35-110 kV overhead lines will steadily increase and will total 20 percent in 1985.

The growth in quantity and ratio of two 35-110 kV transformer substations will reach 50 percent in 1985 and with two-way feed 70 percent.

1.4. A radial-loop principle for building 10 kilovolt power networks and ensuring reserve supply to categorized agricultural consumers.

1.5. Broad utilization in 10 kV agricultural-purpose power networks of closed transformer substations, which are being partially used as distributing points, and of small distributing package units with air leads.

Construction of large livestock breeding complexes and poultry farms, establishment of agroindustrial associations and consolidation of rural populated places requires creation of highly reliable schemes of distributing networks similar in principles of construction to city networks supplying responsible industrial consumers.

Loop distribution networks using the bushing-type transformer substations will be used on a greater scale in large populated places and complexes.

Reserve supply of first category consumers will be ensured via power transmission lines as well as through installation of self-contained reserve supply sources with obligatory use of automatic reserve switching devices.

2. As noted earlier, further raising of power network reliability will to a considerable extent depend on their design.

Production of new kind of SNV-1.5-9.5 and SNV-2.0-9.5 reinforced concrete stands for 0.38 kV overhead lines began during the 10th Five-Year Plan. These stands have great supporting power compared to SNV-1.1-9 and their introduction will make it possible to expand the use of reinforced concrete supports, including in the special ice-covered ground region and to raise reliability of overhead lines.

New reinforced concrete stands for 10.5 meter long supports, production of which is already being mastered at plants, will be used on a broad scale in construction of 10 kV overhead lines.

Work will continue in expanding introduction of supports made of standardized components for 35-110 kV overhead lines.

It is planned to further change the wire structure for power transmission lines. The use of light-gauge wire for overhead lines will be considerably reduced up to refusal to use them. This applies to wire of 16 and 25 mm^2 gauge for 0.38 and 25 overhead lines, of 35 mm^2 for 10 kV overhead lines and of 35, 50 and 70 mm^2 for 35 kV overhead lines. The relative share of heavy-gauge wire will increase accordingly.

3. New, technically more improved switching equipment will acquire further use in rural power stations.

Obsolete switches of the VMB-10 and VMG-133 type with their inadequate drives will be gradually replaced with switches of new design using cells with electromagnetic blow-out, low oil blow-out with sulphur hexaflouride insulation and vacuum ones.

Drives of the PP-67 type and of much older modification will be replaced with modern and highly reliable ones making it possible to implement two-stage automatic reclosing of utilities.

Automatic 10 kV isolating switches, which make it possible to localize a faulty section in a 10 kV network during a no-current condition of an automatic reclosing cycle, will in the long-term be used on a braod scale in 10 kV rural power networks.

The 10 kV RLNDA-10 type circuit breakers which have some operational shortcomings will be replaced with new ones having increased insulation, modernized rotation units and load-carrying contacts of improved design.

The NTMI-10 V measuring transformers, which are often damaged, will in the long-term be turned out by producer plants with increased insulation of the neutral from the 10 kV side and will practically not require any special measures that are needed by transformers currently in operation.

4. The need to introduce complete automation of rural power networks is dictated, first of all, by the comparatively low reliability level of power supply to first category agricultural consumers.

Moreover, the long-term considerable increase in the length of agricultural-purpose power networks and the use of more complex schemes of external power supply to agricultural consumers with the necessity of simultaneous absolute reduction of maintenance personnel will gradually lead to a considerably increased volume of service of power network facilities. Servicing such volumes without introducing means of supervisory and industrial control over power networks will be impossible in the final analysis.

In this connection the questions of rural power network automation are of very topical significance at the present time.

The first stage in introducing complete automation of rural power networks is working out a scheme of networks for the 10-110 kV power network region including introduction of complete automation.

The second stage in planning introduction of complete automation is the development by a planning organization of a working engineering project, which will take into account the questions of replacing obsolete equipment, relay protection and automatic equipment and installing and adjusting new and more improved equipment and devices in accordance with the requirements of the scheme for long-range development of a particular section of the network.

Introduction of the complete automation system in power network regions also includes putting into operation relay protection devices and automatic control of RES [regional power station] and PES [mobile power station] networks with the aid of microcomputers.

Conclusions

Intensive development of agricultural production on an industrial basis and the need to raise its productivity and labor productivity in agriculture places increasingly greater demands on the reliability of power supply and the quality of electric energy.

To fulfill this task it is necessary:

1. To improve the scheme of power supply to consumers in the rural area and for this purpose to complete drafting technical and economic substantiation for the development of power networks of all RES's in the republic in 1985;

2. To expand work aimed at complete automation of distribution networks and by 1985 to fulfill work on complete automation of networks of one RES at every enterprise;

3. To master production and introduction of progressive designs of supports in power network construction by 1983;

4. To refine in 1981 the schemes for development of 110-35 kV power networks in the rural area for 1981-85 with due regard for plan indicators;

5. To raise the operational level of power networks.

6. To accelerate work in establishing an automated control system (ASU) of distribution networks;

7. To increase the work rate in establishing RED and PES production bases.

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9817
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ELECTRIC POWER

CONSTRUCTION REPORT FOR GAZALKENTSKAYA GES

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Nov 81 p 1

/Article by E. Avakov, Tashkent: "Interview: Chirchik - An Electric River"/

/Text/ The third unit of the Gazalkentskaya GES has been put into operation. The rated capacity of the GES is 120,000 KW. This concludes the construction of hydroelectric power stations called for in the program for making use of the Chirchik River's electric power resources. This program was developed by specialists from the Central Asian Department of the Gidroproyekt Institute imeni S. Ya. Zhuk. Now the total rated capacity of the 19 hydroelectric power stations operating on the main water-irrigation tract of Tashkent and the oblast has reached 1,200,000 KW.

Our freelance correspondent E. Avakov met with D. Zhigarev, who is an esteemed Uzbekistan power engineer, a 1981 prize winner of the USSR Council of Ministers, and the chief engineer of the Central Asian Department of the Gidroproyekt Institute imeni S. Ya. Zhuk.

/Question/ What is the role of the Gazalkentskaya GES in the cascade of the Central Chirchik River hydroelectric power stations?

/Answer/ First, this project is a large source of inexpensive electric power, the average annual volume of which will be 450 million kilowatt-hours, reports Zhigarev. To produce this amount of electric power would requre nearly 130,000 tons of conventional fuel each year. Secondly, the Gazalkentskaya hydroelectric unit significantly increases the power output of the Charvakskaya and Khodzhikentskaya GES's, which are located further upstream. This is done without any impact upon agriculture in Tashkent Oblast, the Uzbek SSR and the South Kazakhstan. This is so because both power stations are operating at peak mode. A great deal of water passes through their turbines every 3 to 4 hours. The Gazalkentskaya reservoir must regulate the 24-hour flow of the Chirchik River. The Gazalkentskaya GES itself operates in a base mode rather than a peak mode. Due to this there is a noticeable increase in the output of all remaining electric power stations.

/Question/ Dmitriy Aleksandrovich, what are the characteristic features of the construction of the last stage of the Central Chirchik River cascade?

/Answer/ It took more than five years to build the Gazalkentskaya GES. Standard construction time periods were reduced by more than two years. The advantages of the cascade method of construction were made evident. The essence of this method lies in the extensive use of the old industrial base of the Charvakskaya GES. There was also no need to build new roads, housing and social and cultural facilities and to install services. Most important, the role of the general contractor was performed by an experienced collective, Charvakgestroy of the Uzbekgidroenergostroy trust. With the substantial support of the Nurek Administration Spetsgidroenergomontazh /special hydroelectric power station construction and installation/ and other collectives a significant gain in the construction time periods was achieved. The builders pledged to hand the project over by 22 December - Power Engineering Day. But they managed to do the job one and a half months earlier than this. Expenses for the construction were also reduced - they will be recovered in less than one year of the operation of the GES. The brigades of A. Sokolov, V. Krizhanovskiy, V. Kiselev and other collectives performed very well.

/Question/ Dmitriy Aleksandrovich, tell me if this concludes the program for power and irrigation construction on the rivers of this region?

/Answer/ No. Next in line is the tributary of the Chirchik River - the Pekem. We plan to tap this mountain stream in several places. To select for the needs of the economy a portion of the energy of this obstinate river. To create rest areas on the banks of the river. As you can see there is still a lot of work for the designers and builders in this area.

8927
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ELECTRIC POWER

EKIBASTUZ GRES NO 1 CONSTRUCTION REPORT

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 4 Nov 81 p 1

/Article by V. Stupak, correspondent for KAZAKHSTANSKAYA PRAVDA, Ekibastuz, Pavlodar Oblast: "Power Unit No. 4 Begins Operation"7

/Text7 At Ekibastuz GRES no 1 the new 500,000 MW unit has generated industrial current. The rated capacity of the electric power station has reached 2 million KW. Now construction work on the first section of the GRES will come to an end.

None of the three previous power units took so long to be put into operation as this one. It should have been put into operation last June. In approximately the same condition the first 500 MW unit was put into operation; this one was no exception: experience has shown that the costs are too great for haste. A large number of every conceivalbe problem, which show up during operation, forces frequent shutdowns to be made. This time the Ekibastuz construction workers, in spite of the great temptation to make a triumphant report, had no desire to take shortcuts and abbreviated variants. Instead they concentrated on finishing the turbogenerators, boiler and systems and doing away with shortcomings. This is a qualitatively new attitude toward the introduction of capacities.

Yuriy Iosifovich Braslavskiy, the chief engineer of the Ekibastuzenergostroy Trust, just before final adjustment operations, said that "no power unit has ever been so carefully checked and "cleaned" of defects prior to being put into operation."

The startup of the fourth power unit marks the conclusion of an important and most difficult stage of the work - the first section of the GRES. The GRES includes, in addition to its own devices, such construction projects as the reservoir, an engineering building and a chemical water cleaning plant. With the startup of the fourth unit the creation of the first of four Ekibastuz GRES's has crossed the equator; the work front is now narrowing sharply; and the construction of the power units is in progress.

Let us examine the boiler unit. This unit requires the most labor and takes the longest to install. While it took nearly a year to install the first power unit, the fourth unit was installed in six and a half months altogether. In other words the Ekibastuz construction workers have attained the optimal time period, beyond which they can not further compress time without compromising quality. How did they manage to cut the time required for construction by almost half?

"First of all we must give our engineers and Beketermir Aralbayev's brigade their due," says the deputy chief of the Sredazenergomontazh /Central Asian power station installation trust/, Ye. Ya. Chzhen. "They have done an outstanding job of installing the boiler unit. What was it like before? They sought to "throw" together as many boiler units as possible. When we raise the final unit into place, we shout 'hooray'. Then a sea of welding begins. All the boxes and all of the pipelines (there are kilometers of them!) must be welded. In principle all of these tasks can be done at the same time rather than after they are in place, where it is twice as difficult to do. On the ground on the enlarged space it is easier to do this, where there is mechanization and automatic welding equipment to help. As a result fewer people are required to install the boiler; and the job can be done twice as fast. Turbine workers from the Ekibastuz Administration Sibenergomontazh /Siberian electric power station installation trust/ assembled the complicated machine in just 110 days."

And now the fourth power unit has been carefully cleaned up and adjusted. The command "start" is sounded. Somewhere something is not functioning and with the first push they do not manage to achieve the assigned revolutions. The operation is repeated several times. Finally three thousand revolutions are achieved. The machine, its body trembling, sings its mighty song. The machine operators and installers do not take their eyes from the instruments: is the vibration within the norm; are the bearings heating up? This is now most important.

The long days of the start-up watch pass. The installation and adjustment work proceed endlessly, starting with the basement pumps of the turbogenerators and extending to the safety valves of the boiler. It would seem that there are no significant malfunctions. The decision is made to put a load of 50, 70 and 100,000 KW on the turbogenerator. The machine operates easily, without strain. They increase the load and leave the power unit on a 72-hour test at load. This is what is required for the acceptance of the generator's work. There are no deviations from the norm. You have a good start-up, a new power assistant!

The start-up of the fourth power unit at Ekibastuz at full capacity for the first time will make it possible for the electric power system of Kazakhstan to turn down the "import" of electric power from outside the republic, particularly from the Urals.

8927
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ELECTRIC POWER

BRIEFS

NEW POWER LINES IN MOUNTAINS--Not even eagles fly at this altitude; below the clouds swirl. But the supports for the LEP-500 move higher and higher toward the sky, reaching cliffs at the 3,000 meter level. The new power line will connect the Ingurskaya GES with the Stavropol'skaya GRES. This will make it possible to link together the electric power networks of the Transcaucasus, the Northern Caucasus and the European portion of the RSFSR. This in turn will improve the power supply of these regions. The storming of the pass of the Main Caucasus Mountain range is being handled by subelements of the Kavkazelektroset'stroy [Caucasion Electric Power Network Construction] Trust. In the difficult conditions under a penetrating wind, rain and snow, the builders from the brigades of G. Megreuli, V. Sartaniy, and the bulldozer operators S. Abgaidze and P. Lobeyko, are working tirelessly. One of the most important assignments is being carried out by the brigade of T. Dzordzenidze. Near the Dautskoye Ravine this brigade is erecting the supports of a special design, which are capable of withstanding loads on the largest crossing, the length of which is 1,750 meters. In the world practice of building electric power lines in the mountains, this is a unique case. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 17 Oct 81 p 2] 8927

MARYYSKAYA GRES POWER LINES--The Maryyskaya GRES - Karakul'. A power transmission line extending 368 kilometers has joined the Turkmen republic's largest electric power station with the region where there is intensive development of the chemical and mining industries in the valley of the Zarafshan River. [Text] [Moscow PRAVDA in Russian 11 Oct 81 p 2] 8927

MORE ON MARYYSKAYA GRES POWER LINES--A powerful flow of energy has proceeded from the Turkmen SSR to the Uzbek SSR: the LEP-500 from the Maryyskaya GRES to Karakul' has been put into operation. The power transmission line extending a distance of 368 kilometers has been completed across the sand dunes of the Southern Karakumy. This line joins the largest electric power station of the Turkmen SSR with the region where there is intensive development of the chemical and mining industries in the valley of the Zarafshan River. The dispatchers of the Central Asian Unified Electric Power System are now able to regulate power flows from the west to the east. During the past several years in Central Asia hundreds of kilometers of high-voltage LEP's have been built. A unified network of such power lines has come into being between the Nurek GES in the Tajik SSR and the Syr'Dar'ya and Tashkent thermal electric power stations in the Uzbek SSR and the Toktogul'skaya GES in the Kirghiz SSR. [Text] [Yerevan KOMMUNIST in Russian 18 Oct 81 p 1] 8927

FINAL POWER UNIT AT THE GAZALKENTSKAYA GES--The third and last power unit of the Gazalkentskaya GES in the Uzbek SSR has been put into operation one and a half months ahead of schedule. The collectives of the subunits of the Uzbekgidroenergostroy Trust and the Nurek Administration Spetsgidroenergomontazh planned to test the unit by 22 December - on Power Engineers' Day, but they managed to complete their assignment ahead of schedule. The selfless work of the brigades of A. Sevast'yanov, V. Burtsev, A. Sokolov, E. Yuldashev, V. Krizhanovskiy, V. Kiselev and others was crowned with success. The rated capacity of the electric power station will be 120,00 KW. The new GES is the 19th to be built on the Chirchik River. Now the builders must apply themselves higher - to the tributary of this mountainous river - the Pekem, where a new cascade of electric power stations is to be built. [Text] [Moscow IZVESTIYA in Russian 12 Nov 81 p 3] 8927

MOLDAVIAN GRES--A highly economical steam-gas power unit (PGU) with a rated capacity of 250,000 KW has started operating at the Moldavian GRES. To produce one kilowatt-hour of electric power this piece of equipment expends 20 grams less fuel than the standard two-hundred MW units that are functioning at the electric power station. The economy indicator is rather high. It objectively evaluates the results of the work of scientists, designers and machine builders of Leningrad, L'vov, Khar'kov and Taganrog, who created the new PGU. It represents a power "tandem". It includes an improved power unit with a rated capacity of 210,000 KW and a gasturbine unit that is not common for such thermal electric power stations. The PGU unit plays the most important role in this pair. It also produces electric power and the expended gases with a temperature in excess of 450 degrees are directed into the steam boiler of the power unit. Here the gases return their heat and simultaneously improve the combustion of the fuel, since they contain a large amount of oxygen. The gasturbine unit performs one other duty: it improves the stability of supplying energy to Moldavian customers, the neighboring oblasts of the Ukraine and Bulgaria, where a high-voltage power line has been extended from the GRES. In order to put it into a working mode requires less than 10 minutes. This is of particular importance when there is an uneven scheduling of the 24-hour consumption of electric power and when it is necessary to quickly increase the production of electricity. Data from the Moldavian Electric Power Authority attest to the economical effect of the new equipment. PGU units will make it possible to conserve each year more than 15 trainloads of conventional fuel. This is the amount of fuel required by the Moldavian GRES to produce electric power over nearly a four day period. [Text] [Kishinev SOVETSKAYA MOLDAVIYA in Russian 17 Oct 81 p 1] 8927

MARYYSKAYA GRES CONSTRUCTION REPORT--The construction of the first section of the Turkmen SSR's largest thermal electric power station - the Maryyskaya GRES imeni 50 Years of the Turkmen SSR - is now in its final stages. A power flow of electricity - 1,260,00 KW - will proceed from the southernmost Soviet republic into the unified power network of Central Asia. The reliability of the Turkmen SSR, the Uzbek SSR, Kirghiz SSR and the Tajik SSR power supply has been increased. /Text/ /Ashkhabad TURMKENSKAYA ISKRA in Russian 1 Nov 81 p 1/ 8927

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BALTIC REPUBLICS DEMONSTRATE ENERGY-SAVING DEVICES IN MOSCOW

Riga SOVETSKAYA LATVIYA in Russian 4 Nov 81 p 2

[Article by N. Karpenko (Moscow): "In the Piggy Bank of the Thrifty Ones"]

[Text] A topical exhibit, "Saving Fuel and Electricity in the National Economy," is in action in the Electrification Pavilion at VDNKh SSSR [Exhibition of Achievements of the USSR's National Economy]. Its content is interlaced with 26th CPSU Congress decisions and is in keeping with the CPSU Central Committee and USSR Council of Ministers decree, "On Strengthening the Work to Save and to Make Rational Use of Raw-Material, Power and Other Material Resources."

As is apparent from the exhibit's content, there are many unused reserves in the country. Each year, for instance, we consume about 2 billion tons of standard fuel equivalent. In so doing, about 350 million gigacalories of secondary energy are formed--heat, which is obtained from the basic operating processes and can be used rationally for production needs. How this is done is related in a special division of the exhibit.

An integrated heating scheme for making soda ash that was developed by the State Scientific-Research and Design Institute for Basic Chemistry and the science-and-production association Tekhenergokhimprom is interesting to specialists. Various elements of this scheme can be used in chemical-industry production facilities where liquid waste is formed at high temperatures and with a large salt content.

The use of secondary energy resources in a new heating scheme that has been introduced at enterprises in Sterlitamak and in the Crimea has enabled the consumption of primary fuel to be reduced by almost 30,000 tons and still waste to be cut by about 110,000 cubic meters. A one-time economic benefit from introducing the scheme is 1 million rubles.

Items demonstrated at the exhibit were interesting. For example, a new device, a "combined panel and air-cooled luminaire," combines simultaneously both illumination and ventilation functions. Moreover, this device automatically regulates the air pressure in the premises. The panel is intended for use in production areas with a controlled microclimate.

As is known, electricity can decompose water. Using this principle, Kiev innovators worked out an inexpensive compact device, the Fakel-1, which can replace the centralized system for supplying hydrogen and oxygen from tanks, which is expensive and inconvenient in operation, and also a high-voltage electrical machining installation that is dangerous in operation. The instrument automatically decomposes distilled water into oxygen and hydrogen, forming the required gaseous mixture for a miniature torch. Ten grams of water are completely adequate for an hour of continuous burning, and time of continuous operation without adding water is 16 hours.

The republics of the Soviet Baltic are demonstrating their developments at the exhibition. For example, Lithuania is displaying several original exhibits, one of which is a device for interweaving so-called filaments during the production of acetate, capron, lavsan and other synthetic threads.

Innovators of the Kaunass Artificial Fibers Plant developed a system for the automatic startup of a large number of asynchronous electric motors after a short-term reduction in grid voltage.

A device created by Vilnius scientists saves a considerable amount of fuel in welding units with gasoline engines. The innovation reduces the rotating frequency of the welding unit's motor during lengthy interruptions (more than 20 seconds) during the welding process.

V-2000 type diodes created in Estonia merit attention. They are intended for use in low-voltage rectifiers of resistance-welding machines and galvanizing equipment. The diodes are distinguished by a reduced loss factor and higher stability in the face of temperature shifts. It is not by chance that they enjoy great demand in the country.

Soviet Latvia is widely represented in the pavilion. Among the devices that have been developed in the republic is a panel-type air distributor for forced ventilation systems, a conveyor installation for thermal-radiation drying, an Arkon-1 type automatic device, and others. The first innovation was introduced at the Avrora hosiery factory, the Parizes Komuna combine and the Rigas Aditays Association. It enables narrow cold-air streams that arise during the production process to be reduced to naught. And this is very important. For, during hosiery production alone, air flows in the working area reach a high speed, and, as a result, yarn whips on the automatic knitting machines. The cause of this is an unperfected air-distribution arrangement. Staff workers of Proyektpromventilyatsiya [Institute for the Design of Industrial Ventilation Systems] considered this and created the above-mentioned paneled air distributor. The effect of their use has been substantial.

And what is the essence of the radiation drying of paint on luminaire reflectors that is used on a conveyor installation at the Riga Illumination-Engineering Plant? Here, as the moving speed of the conveyor increases, its productivity has been raised correspondingly 4.5-fold, and the quality of the painted surface of the luminaire reflectors has been increased. Eleven million kilowatt-hours of electricity and 7,940 gigacalories of heat are saved.

The concluding division of the exhibit shows the work experience of Kemerovskaya Oblast labor collectives on the rational use of fuel and power resources. Much experience has been gained here in one of the largest energy-consuming regions, in the field indicated. When it is considered that about 50 million tons of coal, more than 1 million tons of mazut, half a million tons of gasoline and about 800,000 tons of diesel fuel are consumed here annually, it is clear what an enormous economic benefit a saving of just 1 percent of fuel resources will yield.

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MEASURES FOR CONSERVING PETROLEUM PRODUCTS IN BELORUSSIAN AGRICULTURE

Minsk SEL'SKAYA GAZETA in Russian 18 Dec 81 pp 1, 3

/Article: "In the Belorussian SSR Council of Ministers"/

> /Text/ The Belorussian SSR Council of Ministers adopted a decree on serious shortcomings in the utilization of petroleum products in the republic's agriculture.

The decree notes that the ministries of agriculture and of land reclamation and water resources, the Belorussian SSR State Committee for Supply of Production Equipment for Agriculture and their local bodies did not take all the necessary measures to resolutely stop the deficiencies in the utilization of petroleum products in agriculture and did not ensure strict control over an unconditional fulfillment of the assignments established by the decree dated 3 September 1979 of the Belorussian SSR Council of Ministers and by the decree dated 3 July 1981 of the Central Committee of the Communist Party of Belorussia and the Belorussian SSR Council of Ministers.

In many enterprises, organizations, associations, kolkhozes and sovkhozes subordinate to them, in practice, measures to ensure an economical expenditure of fuels and lubricants are not implemented and the proper fight against cases of mismanagement and waste in their utilization is not waged. The recording and writing off of petroleum products have not be organized properly and there are cases of padding of the volumes of transported goods and of the run of motor vehicles, which creates an imaginary saving of fuel and the conditions for its squandering and misappropriation. The release of a large number of motor vehicles with faulty speedometers on the line also contributes to this. The writing off of the deficient and overspent amount of gasoline and diesel fuel from production costs without a careful examination of the causes and without making the guilty financially responsible for this is tolerated. Measures of moral and financial incentives for the saving of fuels and lubricants are applied inefficiently. The managers and chief engineers of many farms keep aloof from the most important work on the saving of petroleum products.

An especially unsatisfactory situation with the utilization of fuels and lubricants was revealed on kolkhozes and sovkhozes and at other enterprises and organizations of agriculture in Gomel'skaya and Mogilevskaya Oblasts, as well as in Kirovskiy, Lepel'skiy, Mostovskiy, Myadel'skiy, Smolevichskiy and Khotimskiy Rayons.

The ministries of agriculture and of land reclamation and water resources, the Belorussian SSR State Committee for Supply of Production Equipment for Agriculture and the Belorussian Administration of Interkolkhoz Construction do not advise all the subordinate farms of the norms of expenditure of gasoline and diesel fuel for motor vehicle freight transport and tractor work established in annual plans, as a result of which these norms are overstated without substantiation in the localities. Both last and this year on the kolkhozes and sovkhozes and at the other enterprises and organizations of these ministries, of the Belorussian SSR State Committee for Supply of Production Equipment for Agriculture and of the Belorussian Administration of Interkolkhoz Construction gasoline was greatly overspent in freight transport as compared to the need according to the established norms.

The faulty practice of allocation by kolkhozes, sovkhozes and rayon associations of the Belorussian SSR State Committee for Supply of Equipment for Agriculture and of the Belorussian Production Association for Agrochemical Services to Agriculture of petroleum products from the stocks of agriculture to various nonagricultural consumers has become widespread.

The fulfillment of the assignments for the construction of petroleum warehouses on the republic's kolkhozes and sovkhozes was not ensured in 1980. In 9 months of this year only 34 petroleum warehouses, or 16 percent of the assignment, were put into operation, two petroleum warehouses were built in Brestskaya Oblast and two, in Gomel'skaya Oblast, while the assignment called for 32 and 41 respectively, and not a single warehouse was built in Mogilevskava Oblast. The rayon production associations of the Belorussian State Committee for Supply of Production Equipment for Agriculture do not always promptly carry out the full volume of work on the technical servicing of petroleum warehouses of the kolkhozes, sovkhozes and organizations of the Belorussian SSR Ministry of Land Reclamation and Water Resources. As a result, on a number of farms the existing capacities and equipment operate with deviations from the established requirements, which leads to great losses of gasoline and diesel fuel.

The Belorussian SSR Council of Ministers made it incumbent upon the Belorussian SSR ministries of agriculture, of fruit and vegetable industry, of land reclamation and water resources and of food industry, the Belorussian SSR State Committee for Supply of Production Equipment for Agriculture, the Belorussian Administration of Interkolkhoz Construction, the Belorussian SSR State Committee for Supply of Petroleum Products and oblast and rayon executive committees:

to immediately examine the state of affairs with the utilization of petroleum products in agriculture, to eliminate the serious shortcomings existing in this matter and to ensure an unconditional fulfillment of the assignments and requirements envisaged by the decree dated 3 September 1979 of the Belorussian SSR Council of Ministers and by the decrees dated 3 July 1981 and 18 September 1981 of the Central Committee of the Communist Party of Belorussia and of the Belorussian Council of Ministers;

to discuss during the first quarter of 1982 in all labor collectives measures for an economical utilization of petroleum products; to place their fulfillment under unabated control; to consider fuel saving one of the most important jobs of every machine operator, truck driver, manager and engineer; to more widely apply the award of bonuses for the saving of petroleum products and the measures of financial responsibility for their overexpenditure envisaged by the decree dated 28 April 1967 of the USSR Council of Ministers;

to advise all the subordinate farms of the norms of fuel expenditure established in plans and of the assignments for fuel saving and to ensure the expenditure of petroleum products in accordance with these norms;

to intensify the control over the utilization of fuels and lubricants in agriculture and to make the individuals guilty of their uneconomical expenditure and squandering strictly responsible for this; not to leave a single case of padding of the volumes of freight transport and of the run of motor vehicles without a proper reaction;

to implement specific measures to ensure an appropriate technical state of trucks and their efficient utilization in freight transport; to strive for a rise in the coefficients of utilization of the pool of run and freight capacity of motor vehicles up to the level of these indicators at advanced farms and organizations; to avoid a release of motor vehicles on the line with faulty and unsealed speedometers;

to ensure an unconditional fulfillment of the assignments for the construction and reconstruction of petroleum warehouses on kolkhozes and sovkhozes;

to organize everywhere socialist competition among machine operators and truck drivers for the saving of fuels and lubricants.

Comrades Sen'ko, Pozharskiy, Pavlyuchuk, Yakushev and Kichkaylo are warned that they are personally responsible for ensuring an unconditional fulfillment of the party and government decisions on an economical and efficient utilization of petroleum products.

The Belorussian SSR Council of Ministers made it incumbent upon the Belorussian SSR State Committee for Supply of Production Equipment for Agriculture:

with the participation of the Belorussian Republic Administration of the USSR State Committee for Standards to examine the problem of organization of the repair of motor vehicle speedometers and to adopt the necessary decision;

together with the Belorussian SSR ministries of agriculture, of fruit and vegetable industry and of land reclamation and water resources to ensure in the shortest period an appropriate technical state of the equipment of all petroleum warehouses on kolkhozes and sovkhozes and at other subordinate enterprises and organizations, as well as a prompt and quality performance of the technical servicing of this equipment.

The Belorussian SSR ministries of agriculture, of fruit and vegetable industry and of land reclamation and water resources, the Belorussian SSR State Committee for Supply of Production Equipment for Agriculture and Glavpoles'yevodstroy must examine at board meetings the problem of measures to ensure an efficient utilization of petroleum products at subordinate enterprises and organizations, issue the appropriate orders and establish the strictest control over their execution.

Ministries, departments, oblast and rayon executive committees, enterprises and organizations are forbidden to transfer petroleum products from the stocks of agriculture for purposes not connected with agricultural production.

The Belorussian SSR ministries of domestic services for the public, of housing and municipal facilities, of education, of culture, of local industry and of construction and operation of motor roads, the Belorussian SSR Cooperative Union and other ministries and departments together with the Belorussian SSR State Planning Committee must take the necessary measures to improve the substantiation of the need of all subordinate organizations for fuels and lubricants, to obtain stocks for them in accordance with the established procedure and to efficiently expend petroleum products.

The Belorussian SSR ministries of agriculture, of fruit and vegetable industry and of land reclamation and water resources, the Belorussian SSR State Committee for Supply of Production Equipment for Agriculture, the Belorussian Administration of Interkolkhoz Construction and oblast executive committees must report to the Belorussian SSR Council of Ministers on the work done to improve the utilization of petroleum products in agriculture as of 1 July 1982 and 1 January 1983.

11,439
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ENERGY CONSERVATION

CAUSES OF, REMEDIES FOR COAL LOSSES DURING RAIL TRANSPORT ARGUED

Moscow EKONOMICHESKAYA GAZETA in Russian No 46, Nov 81 p 14

[Article by B. Sidorenko (Donetsk-Voroshilovgrad): "Losses en Route"]

[Text] Thoughts About the Causes of Coal Losses During Hauling.

Coal is hauled with epithets. It is called both "black gold" and "industry's bread," while at Donbass [Donets Coal Basin] mines the phrase, "tough coal," has become common usage recently. For the miners have to go down to a depth of a kilometer or more for it. The most valuable coal--coking coal--often is bedded in thin seams of sharp strike, which complicates greatly the mining of it. Therefore, the miners' desire that Donbass "tough coal" that has been brought to the surface be saved and used economically is quite natural.

Along the Railroads....

Principally coal trains are made up at the Debal'tsevo Classification Yards. Cars from the hump yard are shunted one after another onto various tracks. A jolt and the next car is joined to its brother for the journey. But at this time coal is strewn liberally on the ground. The roadbed between the rails has become black. In order to prevent the coal from blocking traffic, a converted snowplow machine regularly cleans the track. At first the coal was heaped up in nearby gullies. Then coal heaps began to rise up on both sides of the roadbed.

A few years ago in Donetskaya Oblast a people's control committee received a message: illegal coal sales were occurring at the Debal'tsevo Railroad Yard. "Where is the coal coming from?" the controllers wondered, "for not one mine is near here." It turned out that enterprising operators were getting it from the heaps. The commission that was created observed here at the time more than 100,000 tons of high-quality coal. These "reserves" were transferred to Uglesbyt [Coal Marketing Administration] and in a short time it had been sent to customers.

Now the "surface mine" has been transferred to the Ordzhonikidzeugol' Production Association. As the fuel piles up, workers equipped with excavators come here and load it into railroad cars. It is said that this source has become of considerable help to the association in fulfilling state plans.

"Again, about 30,000 tons of coal have accumulated in the heaps," decides leading engineer L. Babikova, chief engineer of UkSSR Minugleprom [Ministry of Coal

Industry], who came with me to the Debal'tsevo Classification Yard. "...It is time to resume loading."

At one time the oblast and republic people's control committees charged the railroads with responsibility for being thrifty with the coal that had been gathered. Unfortunately, they have forgotten about this today at Debal'tsevo.

"Take a look," points out Lyubov' Ivanovna, "some of the coal is being used to widen the roadbed. They have already managed to cover it up with sand."

Debal'tsevo is the largest railroad yard in the Donbass for classifying coal trains. Three thousand cars are made up into trains here in a day, while 2,800 cars with coal are made into trains each day in Yasinovataya and 1,000 in Ilovaysk. And losses are great also at these railroad yards, but the coal gathered here cannot be shipped for industrial needs. The fact is that it is mixed with crushed rock, gravel and sand.

There Is Help, But...

"Black gold" is lost not just at classification railroad yards but also en route. If the coal is loaded higher than the car's sides, it is blown off.

"When a train with finely ground coal passes on the railroad, a black cloud often remains behind," says Makeyevka Railroad Yard chief T. Kaliberda.

Naturally, it is quite difficult to estimate these losses. I will give just one figure. According to data of the Novosibirsk Institute of Railroad Transport Engineers, up to 4.5 tons of coal are lost from each gondola because of swirling and blowoff of fine particles.

How to prevent swirling? There are methods and they have been known for a long time. Levelers, packing rollers and installations for covering the cars with a protective film are used. The main question, however, is,how widely are they used?

A recent check by the Donetskaya Oblast People's Control Committee indicates that out of 163 loading points in the oblast, there are packer-rollers at only 18 of them. For the Donbass as a whole, the figures are: out of 495 loading points, 156 have been equipped with levelers, only 46 with rollers. The experience of Kuzbass [Kuznetsk Coal Basin] miners, who for more than 5 years have been using installations for applying a protective film successfully, is being introduced slowly. In the Donbass there is as yet only one such installation--at the Voroshilovgrad Preparation Plant. Last year it was recommended that they be introduced at the Komsomol'skaya and Uzlovskaya TsOF's [Central Preparation Plants], but the business has gone no farther than talks. Therefore, the intentions of the republic's Minugleprom to have six installations by the end of the current five-year plan raises doubts.

There Will Be a Roof, But No Bottom.

"But even if you level off the coal, roll it and apply a film to the cars, losses will not disappear. There will be a roof but no bottom," deputy chief of the Industrial Transport Administration of UkSSR Minugleprom Yu. Boyko reflects somberly. And one cannot help but agree with him. Especially if you visit the Komendantskaya Preparation Plant, the country's largest, which is in Voroshilovgradskaya Oblast. Each day 20,000 tons of coal arrive here by rail and 14,500 tons of prepared coal are loaded up.

"Almost 90 percent of the cars require repair," complains TsOF director V. Panfilov. We accompany him along the spur tracks. There are cracks in almost every car--on the floors and the sides. In some places planks have been broken and doors and hatches have been warped out of alignment.

"Even in new cars there are fairly wide cracks," says Vladimir Kuz'mich. "Because a gap of 7 millimeters is allowed between the hatch cover and the lower framework, and our coal's fine fractions are from zero to 6 millimeters in size. We have to repair both new and old cars here with our own people."

Ya. Kornev, chief of the loading section, approaches us. Under him are 32 people, who are on round-the-clock shiftwork. During a shift the loaders fix up holes in 70 cars. Planks and, sometimes, thick paper serve as repair material. Ya. Kornev names a figure: each month 200 cubic meters of lumber go into this repair.

"But is this really repair?" he continues. "There is no way to attach the plank to the iron. We cover it over, but en route it comes off. And the coal is strewn over the roadbed after many hours of travel."

The picture is similar at the Kiev TsOF, which is located in Donetsk.

"The railroaders give us not only unsuitable cars, but also uncleaned ones," says preparation plant chief engineer A. Yermolenko indignantly. "In some there is salt residue, in others clay. And there is not enough time to clean them. And when you impose penalties, you will not even receive them."

It should be said that the Donetskaya Railroad has recently improved work on preparing the car fleet. Twenty-six mechanized centers have been established, where Donbass-1 and Donbass-2 machines have been installed. Each day they rejuvenate 1,300 cars, more than the republic's other railroads. But, as we see, this is small for the Donbass.

From Claims to Collaboration

A dispute has been going on for years now between the Donetsk Railroad and the republic's Minugleprom about who is guilty for coal losses and who should bear responsibility for them. In response to a check that was made by the oblast and republic people's control committees, multiple-page reports with numerous mutual claims were written.

The railroaders are being called upon to introduce more actively installations for applying protective films, levelers and packing rollers. It is urgently required that car scales be set up at all coal-loading railroad yards. Strange as it may seem, not everywhere is coal being weighed before dispatch. According to Minugleprom's far-from-precise data, the level of weighing reaches about 94 percent for the republic as a whole. But in some associations, for example, Pervomayskugol', it is less--82 percent. In any case, there are many scales of obsolete design, which determine weight rather approximately. Minugleprom, in turn, completely correctly considers that the railroad should have more mechanized repair centers and that specialized coal-carrying cars have been needed for a long time.

I would like to dwell especially on one of the coal producers' claims. In reports it is formulated like this: "Make the railroad responsible for protecting the coal while it is en route, for which purpose require that fuel be accepted and turned over by weight, as determined on railroad-car scales." It would seem that this desire should receive the most serious study. For, in receiving coal for hauling, which ordinarily lasts for several days, the railroaders are not responsible for its protection. True, if at the end of the trip the weight proves to be considerably less, the freight recipient together with representatives of the railroad will make up a commercial report. The guilty one, naturally, proves to be the freight shipper. In the first place, it is impossible to establish what kind of losses occurred en route. And second, the freight recipient is not motivated to aggravate relations with the railroaders.

Thus reports about short delivery go to the republic's Minugleprom. And when the dispute is examined in Gosarbitrazh, the railroad always comes out innocent. As a rule, a report about coal weighing at the dispatching railroad yards is not even taken into consideration. As a result, each year the ministry pays out to customers more than 2 million rubles in penalizing sanctions for coal of insufficient weight.

There are no few counterclaims and disputes, as we see. But coal losses en route continue as before. And the losses are not small. It would seem that the time has long arrived for mutual claims to be converted to joint work to eliminate them. The more so since UkSSR Minugleprom and the Donetsk Railroad Administration are located literally across the street from each other. Until then the necessary contacts and coordinated actions for solving this severe problem cannot be found.

11409
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ENERGY CONSERVATION

INDUSTRIAL TEST OF NEW COMBUSTION TECHNIQUE FOR POWER PLANTS DELAYED

Moscow IZVESTIYA in Russian 13 Nov 81 p 2

[Article by K. Seleznev, rector of the Leningrad Polytechnic Institute, doctor of engineering sciences, professor, and RSFSR distinguished scientist and engineer; and V. Pomerantsev, chief of the Department of Reactors and Steam-Generatorbuilding of LPI [Leningrad Polytechnic Institute], doctor of engineering sciences, professor, and RSFSR distinguished scientist and engineer: "Save Metal and Fuel"]

[Text] New Boilers for Power Engineering Will Be of Help.

It has been 12 years now since the collective of the Department of Reactors and Steam-Generatorbuilding of our institute has been studying the problem of creating high-capacity steam generators. Such units were mentioned in an article by Academician S. Kutateladze, "What It Costs to Be Wedded to the Old" (IZVESTIYA, No 188, 1981). The author refined the question about the need to create basically new types of boiler units for the high-capacity electric-power stations of the Kansk-Achinsk Fuel and Power Complex.

Such units should combine high operating economy and greatly reduced dimensions, which is governed to a great degree by the fuel-combustion scheme. Our institute, jointly with the collectives of a number of power stations, boiler plants and design, scientific and educational institutes, has developed a method for low-temperature swirl combustion of fuel.

Its main feature is conversion from the combustion of fine fuel dust, which passes through the firebox but once, to the combustion of a coarsely crushed fuel that is spun around in an active swirl zone of the firebox until it is fully burned.

This system has a number of important advantages. First, the power station is freed of the necessity to have a system for preparing coal dust. And it remains to this day an explosion hazard, especially with Kansk-Achinsk Basin coals. Moreover, the pulverizers that grind up the coal and the pulverized-coal feeders quickly become worn and require frequent repair, with great expenditure of manual labor. The power station has to have one, at times two, repairmen at each pulverizer. And there are eight of these pulverizers at the boiler of a high-capacity unit. In order to give readers an idea of the immense size of just one pulverizer, suffice it to say that it is nearly five times as large as a KamAZ truck. Because of poor reliability, several pulverizers can be in repair simultaneously, and then the capacity and operating economy of the boiler is reduced.

Moreover, the main mass of the dust burns very rapidly, forming a high-temperature nucleus of hot flame. The temperature within it reaches 1,700 degrees. The fuel's ash is mainly fused, and then, in the form of slag nodes, it settles on the boiler's pipes. The necessity for equipping large boilers with a multitude of blowing-off equipment emerges. Thus, there will be 150 of these units on the boiler for the Berezovskaya GRES.

Moreover, toxic oxides of nitrogen and sulfur are formed in the nucleus of the hot flame, and the amount can prove to be so great that the gas level of the environment exceeds permissible norms, and then it will be forbidden to site electric-power stations alongside the coal fields, but instead they will have to be placed at a substantial distance. And, finally, the dust fireboxes have to be specially designed for each type of fuel.

In the scheme that the Leningrad Polytechnic Institute worked out, these deficiencies are basically excluded. Large chunks of fuel burn, filling the entire space of the firebox, and the high-temperature flames thus disappear. The temperature of the swirl firebox's flames is reduced by more than 200 degrees, and the ash in it practically does not melt. Thus, the question of slag forming and the need to have an enormous blowoff-apparatus system are completely removed.

A boiler with a low-temperature swirl firebox can operate on various types of fuel. This has been confirmed by experience.

Conversion to the basically new solution for equipment requires also a basically new approach to developing a design for the unit as a whole. This was realized by the Barnaul Boiler Plant collective, which fabricated a boiler that was adapted to the new firebox. Unfortunately, the mounting of the boiler at the Ust'-Ilimskaya TETs is taking an extremely long time. Soon it will be a year that the boiler has been lying uselessly at the power station. The new equipment is rusting, and millions of rubles are frozen. We consider that timely measures must be taken against such poor management. It is still a fact that the new boiler is lying and rusting, and yet, as Academician S. Kutateladze's article points out, the boiler for the Kansk-Achinsk complex's stations is still being designed and its operation will involve the need to overcome major difficulties.

It should be stipulated: the new firebox in our scheme still has deficiencies. When the aerodynamic-flow requirements of the firebox are violated, a partial entrainment of the burned fuel appears. The data that we will receive after start-up of the boiler at the Ust'-Ilimskaya TETs should help to eliminate these deficiencies. But the delay in installing the boiler hampers solution of the problems associated with the introduction of swirl boilers.

It would seem that the new field yields a number of obvious advantages. There are here sharp simplification, a substantial rise in the reliability and economy of operation, an "omniverousness" of the boiler in relation to type and quality of fuel, and, finally, promise for the conversion from the combustion of coal to the energy-technology processing of coal. We must still remember the great Mendeleyev's warning, that burning oil is the same as stoking a boiler with banknotes. Today this can apply equally well to the coals of the Kansk-Achinsk Basin. It is known that a most important problem for modern energy science is a reduction of harmful discharges into the atmosphere: of ash and of oxides of nitrogen and sulfur. The scheme for low-temperature combustion will enable discharges of nitrous oxides and of sulfur anhydride to be cut in half and the collecting of ash particles to be facilitated.

Energy science needs a steam generator that is highly reliable, compact and economical in operation and will pollute the environment to a lesser degree. This question should be resolved on the basis of state policies. For the savings that the new method can yield number in the tens of millions of rubles.

For wide introduction of the new concept in burning power-engineering fuel, close creative collaboration of vuzes with leading branch-of-industry institutes and, above all, with the All-Union Heat-Engineering Institute and the Central Boiler and Turbine Institute, is required. It is within the powers of higher education institutions to work out the new method and to conduct the first stages of its industrial verification and introduction, but bringing it up to "industrial standards" and introducing it widely into power-engineering practice is impossible without the active participation of prime institutes of Minenergomash [Ministry of Power-Machine Building] and USSR Minenergo [Ministry of Power and Electrification].

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TWO AGENCIES ARGUE OVER WHICH SHOULD SUPPLY PIPELINE BUILDERS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 12 Nov 81 p 1

[Article by Engineer V. Lozovoy (Shevchenko): "Between Two Gossnabs"]

[Text] The terminus of the Kalamkas-Karazhanbas-Shevchenko trunk oil pipeline is due for early startup during the first year of the five year plan. There is this line in the "Main Directions for the Economic and Social Development of the USSR": "...speed up assimilation of the oilfields on the Buzachi Peninsula." It has a direct relationship to the construction of the new trunk oil pipeline and its terminating station in the oblast center.

The prime contractor for erecting this complicated engineering facility is the collective of Construction Administration No 4 of Shatlykgazstroy [Trust for the Construction of Facilities of the Shatlyk Gas Field]. Mangyshlak's conquerors still hold fresh in their memories the excellent pace at which that collective had built the head oil-pumping station at the Kalamkas field. It was erected in half the time specified in the plan. The state acceptance commission gave the work quality an excellent rating. The client's representative expressed then his complete satisfaction that construction of the terminal oil-pump station at Shevchenko had been entrusted to the same collective.

SU-4 [Construction Administration No 4] chief L. Korneychuk assumed that it would be possible to use his experience in high-speed construction fully at the new construction site. The more so since the terminus was located not in the Buzachi Peninsula's wilderness but right alongside a railroad yard, where all the freight would arrive.

However, the state of affairs at the construction project today suggests a serious danger that the important facility will not be turned over by the deadline. This year, according to the prime contractor, 4,132,000 rubles are to be assimilated here. But little more than half of that has been accomplished in the past 10 months. Certainly it is not necessary to explain that it will be difficult during the remaining time to make up for the time lost. How could such a thing happen?

Many factors influenced the lag. Not everything went smoothly at the project with respect to labor discipline. The subcontractors did not do their part. And yet it was not just for these reasons that the facility is running a fever. The builders cannot make real progress because of constant interruptions in the supplying of materials.

From a letter in which Shatlykgazstroy manager S. Leydiker appealed almost half a year ago to chief of the Southern Administration for Trunk Oil Pipelines A. Kashirskiy and to chief of Turkmenneftegazstroy [Trust for the Construction of Oil and Gas Industry Facilities in the Turkmen SSR] E. Rumenkov, one can learn that this most important facility, which is being built on the Caspian shore, had not been allocated tens of tons of anticorrosion materials, about 16,000 square meters of fiberglass fabric and 3,000 cubic meters (a whole trainload) of rock wool. And so on, and so on--for a total of 27 items.

Orders for the materials enumerated had been sent on time. But Turkmen SSR Gossnab did not accept responsibility for outfitting the job, since it was located on Kazakh SSR territory. And Kazakh SSR Gossnab refused to do so because Shatlykgazstroy is based on Turkmen SSR territory. The circle was closed.

It is difficult to believe, but a fact is a fact. The two republic gossnabs could not agree at all between them about who should provide an All-Union construction project with the necessary materials. Justifying themselves from behind parochial barriers, each tried to prove, with a persistence worthy of better application, that "this is not our business." And, while the verbal exchange of fire continues, the builders are in difficulty.

Because of the lack of insulating material, the collective of Kazteploizolyatsiya [Kazakh Administration for Applying Thermal Insulation], for example, could not do its work. SU-4 did not begin to paint a finished gas storage tank because there was no epoxide enamel for protecting the inner surface from corrosion. Now several times as many people will have to be allocated in order to perform the same amount of work.

It is difficult to call the attitude of the two republic supply organs toward providing the builders of the new trunk oil pipeline terminus anything but irresponsible. Indeed, if the facility is not started up at the prescribed time, the country will fall short many thousands of tons of oil from the Buzachi Peninsula fields.

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FUELS

URENGOY-PETROVSK PIPELINE CONSTRUCTION PROGRESS

As of 6 July 1981

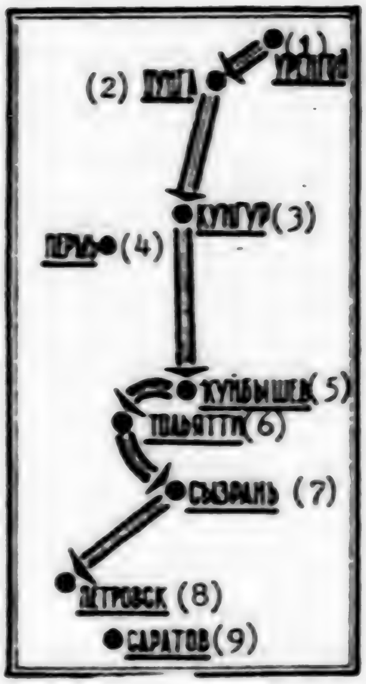
Moscow STROITEL'NAYA GAZETA in Russian 7 Aug 81 p 2

[Unattributed Article]

[Text] Table 1. Key Construction Project Calendar (Work Progress as of 6 July, in Kilometers)

Subunit	Task by the End of the Construction Project	Inverted Welding		Insulation, Laying	
		Done	Remaining	Done	Remaining
Glavsibtruboprovodstroy	854	474	380	421	433
Glavvostoktruboprovodstroy	1115	579	536	440	675
Glavtruboprovodstroy	462	286	176	106	356
Glavukrneftegazstroy	194	105	89	53	141
Soyuzintergazstroy	101	72	29	46	55
Mingazprom	5	Crossing over the Kuybyshev Reservoir			
Total	2731	1516	1210	1066	1660

Discussion of the Data--The gas pipeline construction tempo has, on the whole, increased. At the end of July and beginning of August 14-15 kilometers of pipeline have been insulated and laid in a trench on individual days. The groups of the leading sectors--the Siberian trusts Urengoytruboprovodstroy [Urengoy Pipeline Construction Trust], Severtruboprovodstroy [Northern Pipeline Construction Trust], Priob'truboprovodstroy [Ob Pipeline Construction Trust] are reorganizing their activities. They traditionally carry out line work mainly in the wintertime. Now they must carry it out all year. The collectives of Glavvostoktruboprovodstroy [Main Administration for the Construction of Pipelines in the



Key:

1. Urengoy
2. Punga
3. Kungur
4. Perm'
5. Kuybyshev
6. Tol'yatti
7. Syzran'
8. Petrovsk
9. Saratov

Eastern Areas] have not gotten into the prescribed tempo. In spite of a noticeable increase in the daily pace by the production groups of Glavtruboprovodstroy [Main Administration for Pipeline Construction], they have permitted a large gap between individual types of work. The collectives of Glavukrneftegazstroy [Main Administration for Oil and Gas Industry Construction in the Ukraine] are working below their potential. While their neighbor--the production group of Soyuzintergazstroy [Association of International Gas Industry Construction]--insulated and laid 35 kilometers of pipeline in July; here they did only 20.

In order to successfully fulfill the commitment made for the ahead-of-schedule introduction into operation of the line part of the gas pipeline, the route workers must advance to a pace of laying and insulating 17-20 kilometers of pipeline per day.

The builders have serious complaints against some of the suppliers of mechanisms. They have obtained 11 TG-502 pipelayers, costing 245,000 (rubles) each, from the Sterlitamakskiy Building Machine Plant but these machines have not worked for one day because of various plant defects. Appeals by the chief administration to the supplier plant are not yielding any results.

As of 24 August 1981

Moscow STROITEL'NAYA GAZETA in Russian 26 Aug 81 p 1

/Text/ Table 1. Key Construction Project Calendar (Work Progress as of 24 August, in Kilometers)

Subunit	Task by the End of the Construction Project	Inverted Welding		Insulation, Laying	
		Done	Remaining	Done	Remaining
Glavsibtruboprovodstroy	854	485	369	438	416
Glavvostoktruboprovodstroy	1115	670	445	525	590
Glavtruboprovodstroy	462	345	117	149	313
Soyuzintergazstroy	101	88	13	68	33
Glavukrneftegazstroy	194	113	81	72	122
Mingazprom	5	Crossing over the Kuybyshev Reservoir			
Total	2731	1701	1025	1252	1474 km

Discussion of the Data--The past week of 18-25 August has been characterized by a further growth in the tempo of line work and the gradual putting into operation of individual sectors of the mainline. Thus, in the activity zone of Glavsibtruboprovodstroy/Main Administration for the Construction of Pipelines in Siberian Areas/, the production groups have begun to operate another 40 kilometers of gas pipeline. The total length of such sections is now almost 200 kilometers. Nevertheless, the tempo for turning over the completed product has not been sustained in the subunits of the chief administration. The Siberians must pay special attention to the final types of work (recultivation of the land, electrochemical protection, etc.) and must hand over all of the planned 285 kilometers of mainline to the customer by the end of the month for transporting gas to the consumers.

Some groups and Glavvostoktruboprovodstroy as a whole are not carrying out the tasks specified by the schedules. The construction of LEP/electric power transmission lines/ along the route is going slowly. The shortage of excavating equipment, pipe carriers, and tractors is being felt.

8524
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CONFERENCE HELD AT KIEV TO PROMOTE PIPELINE IMPROVEMENTS

Kiev PRAVDA UKRAINY in Russian 14 Nov 81 p 1

[Article by RATAU: "The Reliability of the Industry's Arterials"]

[Text] Kiev, 13 [Nov]. (RATAU [Radio and Telegraph Agency of the Ukraine]). An All-Union conference that ended today in the Ukraine's capital was dedicated to problems of raising the reliability and longevity of trunk gas pipelines. Representatives of 32 scientific-research and design institutes, 25 production associations and a number of ministries and agencies took part in it.

"About 200,000 kilometers of various trunk pipelines are now in operation in our country," said chairman of the conference's organizing committee, chief of the Technical Administration of the Ministry of Gas Industry A. D. Sedykh. "The 'Main Directions' call for further accelerated development of pipeline transport, especially for delivering petroleum product, crude oil and gas. In light of the 26th CPSU Congress's decisions, questions of their reliability and longevity are urgent."

It is not by accident that the Ukraine's capital was chosen as the place for discussing this topic. One of the industry's leading institutes--Soyuzgazproyekt, where large scientific forces have been concentrated--operates here. The collectives of the Institute of Electric Welding imeni Ye. O. Paton and of the Institute of Castings Problems, both of the UkSSR Academy of Sciences, have made substantial contributions to improving methods for joining pipelines and creating special types of steel.

The conference aided in the development of unified technical specifications for pipelines that are in existence or are planned and helped to coordinate scientific research on the creation of hardened rolled metal, modern insulating coverings, and effective systems for monitoring the condition of the arterials, and also on the preparation for conversion to the construction of gas and oil pipelines that are designed for increased pressures.

11409
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CONSTRUCTION OF GAS PIPELINES

Moscow STROITEL'STVO TRUBOPROVODOV in Russian No 10, Oct 81 pp 5-6

/Article by A. K. Dertsakyan of Minneftegazstroy and I. P. Novikov of NIPIESUneftegazstroy: "Criteria for Selecting the Optimum Routes for Transporting Siberian Gas"/

/Text/ The main source of growth in gas extraction over the next few years will be the deposits in the northern part of the Tyumenskaya Oblast. The primary consumers will remain as before the industrial center and large cities of the western and central regions of the country. Thus, the routes for the transportation of gas flows have been predestined to be from the north to the southwest, at a route length of 3,000-4,000 kilometers, with some deviations on one side or the other of a straight aerial line. Economic and geological-geographic factors, the equipping of construction organizations with large highly-mobile equipment, and other things influence and will influence the route deviation.

By what routes is it the most advisable, from a national economic point of view, to transport Tyumen' gas into the central regions?

Three main routes have been established during the past 15 years to transport gas from the SRTO/northern regions of the Tyumen' Oblast/: the northern, through Punga, Ukhta, Torzhok, Minsk; central, through Punga, Nizhnyaya Tura, Perm'; and the southern, through Tyumen', Chelyabinsk, Petrovsk, Novopskov.

Each of the routes indicated has been called upon to optimally connect the source of fuel power resources with the customer. Construction conditions, actual construction installation work, its tempo and quality, the necessity and number of equipment re-basings, etc., must also be taken into account.

The main factors which ought to be considered during a comparative assessment of two or several gas pipeline routes are the engineering-geological and climatic conditions, the economic and geographical conditions of the region through which the gas pipeline passes, and the technical and economic indicators for gas transportation.

The stratification of the terrain is considered when examining the engineering-geological conditions of construction. The ratio of the maximum absolute height of the route sector to its minimum size and the length of the river valleys and ravines in relation to the total area of the examined sector are determined by survey data.

The climatic construction conditions are the outside air temperature, the presence of permafrost soil, and the amount of atmospheric precipitation and snow cover. It is also necessary to consider the average wind speeds in the different seasons, and also the maximum snow movement during winter by wind directions.

The mobility of construction equipment in various construction seasons, the workability of mineral soils, the level of ground waters considering their seasonal fluctuations, swampiness, and a number of other factors are of major importance.

The length of route sectors, parallel to motor vehicle roads and railroads and passing along navigable rivers, belong to the economic and geographic construction conditions. One should also take into account the number of large trans-shipment points and transportation centers relative to the length of the sector.

The extent of the agricultural areas destined for re-cultivation, and the demographic features of the administrative region which crosses the gas pipeline route are of great importance; population density and the overall construction work force supply are related to these features.

It is necessary to evaluate the mobility and operational potential of construction equipment according to the technical characteristics of the basic fleet of construction machines and mechanisms and the maximum permissible loads on natural consistency soils depending, in turn, on seasonal moisture.

Analyzing the work fitness indicators of the machinery and mechanisms jointly with ground water level dynamics, one can distinguish the contours of water-logged ground on special large-scale construction condition maps.

The total water-loggedness in the northern part of the forest zone of the European part of the USSR is an impediment for a period up to three months in both the fall and spring and rules out the movement of construction equipment. On the central and southern routes construction periods are limited only for the spring slush time (not more than one month) because of the high stratification of the relief, the satisfactory filtration properties of the soil and the lower water-loggedness of the land.

The length of the construction season is limited by the process of the freezing of the swamps whose total area for the northern route is ten percent and higher than for the central and southern routes.

The workability of soft and liquid plastic soils, developed mainly on the northern route, is lower compared with the workability of these soils on the central and southern routes. The stickiness of the soil plays an important role. The lake-glacial clays and loams of the Mologo-Sheksninskoye inter-river area have the largest amount of stickiness on the northern Tyumen' gas transportation route. The chernozem soils of the forest-steppe and steppe zones, having stickiness only in the spring and fall slush periods, will be worse for the central and southern routes.

Table 1. General Coefficients Characterizing the Construction Conditions of the SRTO-Center Gas Pipeline

Route Sectors	Construction Price Rises	Growth in Labor Costs*	Decrease in Usable Work Time**
Urengoy-Punga, Urengoy-Tyumen'	1.62	1.2	4.4
Punga-Ukhta	1.20	1.3	2.1
Punga-Nizhnyaya Tura	1.10	1.3	1.8
Ukhta-Torzhok	1.30	1.4	1.7
Nizhnyaya Tura-Perm', Tyumen'-Chelyabinsk	1.25	1.1	1.5
Perm'-Tsentr	1.05	1.0	1.3
Chelyabinsk-Petrovsk-Novopskov	1.00	1.0	1.2
Torzhok-Minsk	1.15	1.3	1.0

The column headers "Construction Price Rises", "Growth in Labor Costs*" and "Decrease in Usable Work Time**" stand under the spanning header "Coefficients".

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*according to construction conditions
**according to meteorological conditions

The increased stickiness of mineral soils and the general peatiness of the land make it impossible to use the highly efficient rotary bucket excavators.

Quicksands, found in the fine-grained sands of water-glacial origin, which are widespread on the lines of the northern route, also decrease the tempo of the earthwork. The covering sandy loams in the northern European part of the USSR and in Western Siberia have high thixotropic properties. The softening of these soils under dynamic loads has been caused by its conversion into a sticky plastic condition and then into a viscous friction liquid state. As a result the use of construction machinery and mechanisms is hampered. The supporting power of the soils can be disrupted simply by running the engines, without even moving the equipment.

The two routes of the Urengoy-Western USSR border gas pipelines have been analyzed beginning with the construction conditions which show a substantial influence on the formation of cost indicators. The table presents regional coefficients reflecting the change in base norms depending on the line varieties. A sector of line in weakly-broken terrain produced by category I and II soils in the central regions of the European part of the USSR has been taken as the base.

The growth in labor costs on the northern line has been caused by the increased labor-intensiveness of all technological operations due to more complex natural and climatic conditions. Therefore yearly construction on the sector to the west of Gryazovets is 30 kilometers. This indicator is significantly higher on the central route. It reaches 80 kilometers a year on the sector to the west of Perm'. According to the calculations of specialists, the gas pipeline along the central route can be built a year earlier than the northern one.

The decrease in construction time periods by the efficient utilization of manpower and material resources at the disposal of Minneftegazstroy/Ministry of Construction of Petroleum and Gas Industry Enterprises/ permits us to obtain a significant national economic result.

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8524
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CLAD PIPELINES BUILT FOR 100, 120 ATMOSPHERES' PRESSURE PLANNED

Moscow IZVESTIYA in Russian 11 Nov 81 p 2

[Article by Yu. Bokserman, deputy chairman of Gosekspertiza [State Commission for Expert Review] of USSR Gosplan, and doctor of engineering sciences: "The Steel Channels of the Rivers of Gas"]

> [Excerpt] What the conversion to higher pressures in trunk gas pipelines will yield.

Gosekspertiza of USSR Gosplan recently completed a review of technical and economic documents that forecast gas and condensate reserves in West Siberia. These reserves will enable the large-scale recovery of valuable types of fuel and raw material to be planned reliably over a long period of time. According to an assessment of the World Energy Congress, the Soviet Union has more than one-third of the natural gas reserves that are deposited under the planet's surface. Of the Union's total explored natural gas reserves of 34 trillion cubic meters, more than 27 trillion are in West Siberia, mainly at fields of Tyumenskaya Oblast's northern region. They--these reserves--will enable the 26th CPSU Congress's goals of bringing gas recovery for the country as a whole up to 600-640 billion cubic meters in 1985 to be fulfilled and further growth in gas recovery to be planned.

In the last year of the 11th Five-Year Plan, the country will recover 55-60 percent of its gas in West Siberia. Because of this, the problem of transporting gas has become severe. Despite the fact that in recent years earnest measures have been taken to site new energy-intensive enterprises in the eastern regions, large amounts of fuel still have to be moved from east to west: in 1980 more than 500 million tons of standard fuel equivalent were moved in this direction, and in the next few years this figure should rise substantially.

As is known, we are erecting gas pipelines that are unique in world practice: they are 1,420 millimeters in diameter, operate at a pressure of 75 atmospheres, and have a productivity of 30-32 billion cubic meters per year for each gas pipeline. During the 11th Five-Year Plan we will have to build at least six such high-capacity trunk gas pipelines. Their erection will require much metal and large amounts of capital investment. Because of this, the question of the need to convert to trunk gas pipeline pressures of 100-120 atmospheres has come up.

One can judge the enormous national-economic importance of transporting gas by pipeline at pressures higher than those now adopted by some computations made by

USSR Gosplan's Gosekspertiza on the specifics of the program for transporting 550-600 billion cubic meters of gas per year from West Siberia to the European part of the USSR.

As these computations indicate, given uniform spacing of compressor stations (90-100 kilometers), converting to a pressure of 100 atmospheres will enable the total length of gas pipelines from West Siberia to be reduced by 15,000 kilometers (by a reduction in the number of lines) and labor expenditures to be greatly cut. At the same time, conversion to an operating pressure of 100 atmospheres will require changes in the economic evaluation of gas transport effectiveness, which should be performed not in accordance with attributed expenditures but in accordance with the economic benefit that the national economy will receive.

Measures should be taken simultaneously to improve gas consumption for in-house needs, primarily by introducing electric drive widely at compressor stations, using electric power obtainable at nuclear and coal-powered stations.

Just what is necessary to support the transmission of gas over long distances at pressures of 100-120 atmospheres? Primarily needed are pipe and equipment: compressors and fixtures.

The Institute of Electrical Welding of the UkSSR Academy of Sciences, in collaboration with organizations of Minchermet [Ministry of Ferrous Metallurgy], Mingazprom [Ministry of Gas Industry], Mintyazhmash [Ministry of Heavy and Transport Machine Building] and other agencies, under the supervision of Academician B. Ye. Paton, developed a new, progressive design of so-called clad pipe, which is manufactured from slightly alloyed steel strip.

It must be said that our country has gained much experience in producing clad vessels. About 200 high-pressure clad equipment items have been manufactured for the chemical industry and other branches of the national economy. This equipment is operating successfully at pressures of up to 300-400 atmospheres at high temperatures. This experience was used in developing the technology for producing clad pipe, a test lot of which was made at a Khar'kov plant and passed comprehensive tests. A test gas pipeline 1.6 kilometers long has been built near Kiev, at which methods for welding, insulating and laying the new class of pipe have been tested. Clad pipe also has been tested successfully in the north of Tyumenskaya Oblast under severe climatic conditions.

In March and April of 1981 tests were held of new-generation clad pipe, so-called quasi-monolithic pipe. During the smelting and rolling of the steel, it was possible to obtain clad metal at once and to produce pipe 1,420 millimeters in diameter from it by ordinary technology. Its strength indices proved to be extremely promising. A consignment of such pipe is now being manufactured for the construction of an experimental segment in the north of Tyumenskaya Oblast.

At the end of 1981 the first phase of a department with a capacity for making 250,000 tons of clad pipe will be put into operation at the Vyksa Metallurgical Plant. In the last years of the 11th Five-Year Plan, this department's capacity will grow to a million tons of pipe per year. The pipe will initially be used to build gas pipelines that operate at 100 atmospheres of pressure, then at 120 atmospheres.

At the same time, a most serious problem for the new class of gas pipelines is that of equipment, mainly gas pumping units. Minaviaprom [Ministry of Aviation Industry], together with Minkhimmash [Ministry of Chemical and Petroleum Machine Building], will do much work on the production of such units, based upon the use of aviation turbines that have served out their time in the air. The concept comes down to the fact that an aviation turbine taken from an airplane can still serve on the ground for a long time, pumping gas over long distances. Modules made of such gas pumping units are compact. They are shipped directly to the line, and, in so doing, the construction of huge buildings is dispensed with.

The first unit, which is now being tested, was built at the Sumy plant of Minkhimmash. It must be noted that the erection of a high-pressure test station has been delayed and that this can disrupt the planned deadlines for producing units based upon 100-120 atmospheres.

At the same time, the fixed turbines that Minenergomash [Ministry of Power Machine Building] produces also are needed. The task comes down to converting to 16,000 and 25,000 kilowatts of capacity instead of 10,000 kilowatts, thus permitting the installation at the compressor station of a minimal number of units, which will thereby provide for high station effectiveness. Minkhimmash is mastering large-diameter high-pressure fixtures and cooling equipment.

We have dwelt on one of the global problems of scientific and technical progress in the area of increasing gas industry effectiveness. Its realization will require more active work by Mingazprom, Minneftegazstroy [Ministry of Construction of Petroleum and Gas Industry Enterprises], USSR Minchermet and the machinebuilding ministries. In the next few years it will be necessary to begin building the first domestic gas pipeline that will operate at a pressure of 100 atmospheres. Its introduction into operation will enable experience in the construction and operation of gas pipelines of especially high pressure to be gained. These operations must be speeded up in every possible way because it is precisely such trunk gas pipelines that will be erected mainly during the 12th Five-Year Plan.

In the final analysis, we are talking about erecting, instead of three traditional gas pipelines at 75 atmospheres, just two made of pipe of the same diameter (1,420 millimeters) that work at 100 atmospheres, and, later, converting to the erection of gas pipelines with an operating pressure of 120 atmospheres, which will enable only one gas pipeline to be built in place of two. When it is considered that capital investment for the construction of each gas pipeline is 2½ to 3 billion rubles, and more than 2½ million tons of pipe will be expended, then it is not difficult to imagine what enormous savings can be obtained by converting to erection of the new class of trunk gas pipelines.

In conclusion, I would like to emphasize that raising the operating pressure in gas pipelines is a complicated task that involves many branches of the economy. It is necessary not only to master new equipment for construction and high-pressure equipment and the operation of the gas systems but also, simultaneously, to overcome psychological barriers on the part of those who are accustomed to traditional methods of transmitting gas over a distance and accept with difficulty a new trend in technical policy. One must not forget the main thing: further accelerated growth of our gas industry is unthinkable without converting to the creation of gas-transport systems with operating pressures of 100-120 atmospheres.

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CSO: 1822/49

TIMANO-PECHORSK TERRITORIAL-PRODUCTION COMPLEX REPORT

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 14 Nov 81 p 2

/Article by N. Zashikhin, Komi ASSR party secretary: "Where the Chain Ends"/

/Text/ The workers of the Komi Republic are successfully implementing the party's program for the comprehensive assimilation of natural resources. We are clearly convinced that such an approach will yield remarkable results. Nearly 20 million tons of petroleum and gas condensate are produced each year in the Komi ASSR. In addition we produce tens of millions of tons of coal and billions of cubic meters of natural gas. The timber industry is also developing on a comprehensive basis. This industrial might reflects the well being of the people and a belief in the future.

One more important sector is also well developed in the Komi ASSR - the refining of the hydrocarbon raw material. The republic has large oil and gas refineries. Their importance extends well beyond the regional interests and needs. Petroleum products, non-freezing lubricants, many important kinds of bitumen, technical carbon and a stable condensate - these are but a partial list of the products manufactured in the refineries of the Komi ASSR.

It is precisely the availability of refineries in locations near the extraction that makes it possible to make efficient use of the kray's fuel and power resources. Not to mention the fact that it is always more advantageous to transport a finished product than raw materials. And, finally, there is one more important consideration. The availability of a developed processing industry is a reliable way of reducing losses. After all one can convert into a valuable product those resources, which cannot be transported at great distances.

This is why the Komi ASSR Party organization is devoting so much attention to the operation of the refineries. Relying upon specialists who are very familiar with production technology, the party committee of the Ukhta refinery have directed the efforts of the collective at making use of internal reserves. Using their own manpower to modernize equipment, the intensification of production processes, and replacing outdated equipment have made it possible in recent years to significantly increase the processing of raw material. More than 60 percent of the product is now being manufactured with the State Mark of Quality. The attained production capacity exceeds the planned capacity by more than 6-fold. And this has been accomplished by the collective without bringing in "outside" construction subelements and almost without any additional allocations.

But no efforts of even a very strong collective can yield the needed effect, if they are not based on a clear, well thought-out technical policy in the sector. In this case we are speaking about the USSR Ministry of the Petroleum Refining and Petrochemical Industry and its association Soyuznefteorgsintez /All-Union Industrial Association for Processing of Oil and Production of Organic Synthesis Products/.

Lulled with glowing reports and favorable figures, the managers of Soyuznefteorgsintez, it appears, forgot about the need to show any concern for the further development and improvement of production and for its serious technical reequipping. As early as 1971 the association decided to modernize the Ukhta refinery; but this decision never went further than a piece of paper. The association's position in time led to a situation whereby a collective, which had long been among the leaders of the sector, producing product and profit in excess of the plan, as of today can no longer guarantee a stable operation.

Let us take, for example, the reservoir park. It is amusing to say, but today at the refinery they are patching the steel reservoirs with epoxy resin. Concerned about the condition of their storage facilities, the refinery's managers have appealed to one of the institutes for its opinion on the reliability of these facilities. But when the institute found out how many years these storage facilities have been in use and when they were installed, it refused to even discuss the matter.

Approximately the same situation exists at the plant raw material pipelines, bitumen units and filling platforms. It is sad to say but a fact: up to this time the refinery does not have a recycled water supply system and is releasing waste into the river that has not been adequately purified.

The technical level of the petroleum refining does not meet present-day requirements. Since 1952 only one small catalytic cracking unit has been built. Thus, most of the raw material is subjected only to primary processing. Of course, this cannot solve the problem of making rational use of the northern hydrocarbon raw material.

Today thousands of tons of high octane gasoline are transported into the Komi ASSR. This includes aviation fuel. All of these products and many others can be produced locally. And not just to meet the needs of the Komi ASSR, but for the entire region. In making correct use of the experience of local personnel and supplies of raw material it would be easy to organize the manufacture of scarce transformer oil and lubricants for work in high temperature environments, and other no less valuable products.

We know how much the national economy needs liquid paraffin. This is the essential ingredient for the production of albumin-vitamin livestock feeds. It would seem that there is nothing more important if we are speaking about the development of livestock raising here in the north and in the regions adjacent to the nonchernozem. And there is more than enough raw material - the Komi ASSR's oil contains a high percentage of paraffin.

In time the technical economic justification for organizing such production at the Ukhta refinery using the "pareks" method was developed. Its high efficiency was convincingly demonstrated. But this project still has not been implemented.

Increasing the refining of hydrocarbon raw material in place is without doubt a useful matter. However, all possibilities are not yet being utilized. Here is a characteristic example. The Sosnogorsk gas refinery and the Ukhta petroleum refinery are neighbors. The Sosnogorsk refinery stabilizes Vuktyl'skiy gas condensate and the Ukhta refiner refines it. It would be inexpensive and advantageous to pump it from Sosnogorsk to Ukhta by pipeline.

Unfortunately, this system is not yet in operation. As a result nearly a million tons of condensate each year must be transported in tank cars to Krasnodar - a distance of 3,500 kilometers. The irrationality of such shipments when there is a nearby refinery is obvious.

The more efficient use of hydrocarbon raw material in the Komi ASSR is hindered by departmental barriers. As recently as the past five-year plan the managers of the administration for northern mainline oil pipelines proposed making use of the casing-head oil gas. For this it was only necessary to feed it into an existing oil pipeline that runs between Usinsk and Ukhta. Then each year 240 to 250 million cubic meters of natural gas and up to 100,000 tons of liquid fraction, which at present must be burned, would be put to good use. This raw material could be fed to the refinery, where there are available capacities for handling it. But this sensible proposal was not supported by the USSR Ministry of the Petroleum Refining and Petrochemical Industry. Why? Because the additional raw material would go to a different department - the USSR Ministry of the Gas Industry.

At the Sosnogorsk gas refinery there is a real opportunity to increase the production of a unique thermal gas black, the demand for which is great in the Komi ASSR and abroad. Near this enterprise flow rivers of natural gas which contains a large amount of ethane. For a long time specialists have been asking about the creation here of a highly efficient complex based on its production. Especially in view of the fact that it would be possible to use the unfinished facilities of the second section for the stabilization of condensate and some of the inactive equipment. However, this problem, too, remains unresolved.

Some interesting ideas on the comprehensive use of the natural riches of the Timano-Pechorsk territorial production complex have been summarized in a paper of the Gor'kiy Scientific-Research Institute of Hydrocarbon Raw Material. One cannot assume that this research paper, just as other useful proposals on this matter, is to be found on the bookshelves of the departments. There is an urgent need for the USSR Gosplan to evaluate these basic proposals and to legislate those which are in the interest of the government.

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